Amendments to the Claims:

The following listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) Apparatus for measuring human blood sugar levels, comprising:

a catheter, the free end of which is to be positioned in a blood vessel, wherein the catheter comprises at least one optical waveguide,

a light source for coupling light into the at least one optical waveguide,

a point of measurement at the free end of the catheter at which point the light is emitted from the at least one optical waveguide, wherein the light is dispersed by the blood and/or transmitted through the blood and wherein the dispersed and/or transmitted light is coupled again into the at least one optical waveguide,

a detector to receive the light which is returned,

a computer unit for analysing the light received by the detector, [[and]]

a cleansing device located at the point of measurement for removing the tissue particles deposited from the

blood[[.]],

[[wherein]] the cleansing device comprises a controllable actuator which frees or wipes clear a light emission orifice of the at least one optical waveguide when activated[[.]], and

the cleansing device is controllable by the computer unit.

2. (Canceled)

3. (Previously presented) Apparatus according to claim 1, wherein a movement of the actuator is generated by a shape memory alloy, a thermopneumatic drive, an electrostatic drive (piezoelement) or a rotor.

4. (Canceled)

5. (Canceled)

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Original) Apparatus according to claim 1, wherein the energy required for control purposes is supplied to the point of measurement in electrical, thermal, optical, mechanical, hydraulic or pneumatic form.

13. (Original) Apparatus according to claim 1, wherein the measurement at the point of measurement is undertaken by means of transmission (irradiation over a specified sampling length) or by means of diffuse reflection from the surface of the catheter.

14. (Original) Apparatus according to claim 1, wherein the catheter is clad with a biocompatible material.

15. (Original) Apparatus according to claim 14, wherein the catheter and the optical waveguide are designed as a single piece of solid material.

16. (Previously presented) Apparatus according to claim 1, wherein the light source, the detector and the computer unit are integrated into an implant together with an energy store for providing voltage.

17. (Previously presented) Apparatus according to claim 16, wherein a telemetry unit is integrated into the implant with which it is possible to transmit data and/or energy between the computer unit and a control unit located extracorporeally, wherein for that purpose a probe is connected to the control unit.

18. (Previously presented) Apparatus according to claim 17, wherein the telemetry unit and the probe have an oscillatory circuit each with an inductor, wherein the oscillatory circuit on the side of the telemetry unit and the oscillatory circuit on the

side of the probe can be tuned for the transmission of data and wherein the data are transmitted without direct contact by coupling the inductors inductively.

19. (Original) Apparatus according to claim 17, wherein the energy content of the frequency transmitted by the control unit to the telemetry unit charges an accumulator or a capacitor for the purpose of providing energy to the implant.

20. (Canceled)

21. (Canceled

22. (New) Apparatus for measuring human blood sugar levels, comprising:

a catheter, the free end of which is to be positioned in a blood vessel, wherein the catheter comprises at least one optical waveguide,

a light source for coupling light into the at least one optical waveguide,

a point of measurement at the free end of the catheter at which point the light is emitted from the at least one optical waveguide, wherein the light is dispersed by the blood and/or transmitted through the blood and wherein the dispersed and/or transmitted light is coupled again into the at least one optical waveguide,

a detector to receive the light which is returned,

a computer unit for analysing the light received by the detector,

a cleansing device located at the point of measurement for removing the tissue particles deposited from the blood, and

the cleansing device comprises a controllable actuator, which comprises a piston which is inserted into a form-fitting opening located at the free end of the catheter and which moves between a position where the piston forms a seal flush with the catheter surface and a position where the piston fits into a recess located opposite the catheter surface, and that in the recessed position a light emission orifice of the at least one optical waveguide becomes free.

23. (New) Apparatus according to claim 22, wherein a movement of the actuator is generated by a shape memory alloy, a thermopneumatic drive, an electrostatic drive (piezoelement) or a rotor.

24. (New) Apparatus according to claim 22, wherein the piston is guided radially within the catheter.

25. (New) Apparatus according to claim 22, wherein the piston is guided axially within the catheter.

26. (New) Apparatus according to claim 22, wherein the piston is actuated by a micromotor with a crank.

27. (New) Apparatus according to claim 22, wherein the piston is actuated by a lifting magnet.

28. (New) Apparatus according to claim 22, wherein the energy required for control purposes is supplied to the point of measurement in electrical, thermal, optical, mechanical, hydraulic or pneumatic form.

29. (New) Apparatus according to claim 22, wherein the measurement at the point of measurement is undertaken by means of transmission (irradiation over a specified sampling length) or by means of diffuse reflection from the surface of the catheter.

30. (New) Apparatus according to claim 22, wherein the catheter is clad with a biocompatible material.

31. (New) Apparatus according to claim 30, wherein the catheter and the optical waveguide are designed as a single piece of solid material.

32. (New) Apparatus according to claim 22, wherein the light source, the detector and the computer unit are integrated into an implant together with an energy store for providing voltage.

33. (New) Apparatus according to claim 32, wherein a telemetry unit is integrated into the implant with which it is

possible to transmit data and/or energy between the computer unit and a control unit located extracorporeally, wherein for that purpose a probe is connected to the control unit.

34. (New) Apparatus according to claim 33, wherein the telemetry unit and the probe have an oscillatory circuit each with an inductor, wherein the oscillatory circuit on the side of the telemetry unit and the oscillatory circuit on the side of the probe can be tuned for the transmission of data and wherein the data are transmitted without direct contact by coupling the inductors inductively.

35. (New) Apparatus according to claim 33, wherein the energy content of the frequency transmitted by the control unit to the telemetry unit charges an accumulator or a capacitor for the purpose of providing energy to the implant.

36. (New) Apparatus for measuring human blood sugar levels, comprising:

a catheter, the free end of which is to be positioned in a blood vessel, wherein the catheter comprises at least one optical waveguide,

a light source for coupling light into the at least one optical waveguide,

a point of measurement at the free end of the catheter at which point the light is emitted from the at least one optical waveguide, wherein the light is dispersed by the blood and/or transmitted through the blood and wherein the dispersed and/or transmitted light is coupled again into the at least one optical waveguide,

a detector to receive the light which is returned,

a computer unit for analysing the light received by the detector,

a cleansing device located at the point of measurement for removing the tissue particles deposited from the blood, and

the cleansing device comprises a controllable actuator which frees or wipes clear a light emission orifice of the at least one optical waveguide when activated, wherein a control action is achieved by means of a hydraulic or pneumatic line.

37. (New) Apparatus according to claim 36, wherein the measurement at the point of measurement is undertaken by means of transmission (irradiation over a specified sampling length) or by means of diffuse reflection from the surface of the catheter.

38. (New) Apparatus according to claim 36, wherein the catheter is clad with a biocompatible material.

39. (New) Apparatus according to claim 38, wherein the catheter and the optical waveguide are designed as a single piece of solid material.

40. (New) Apparatus according to claim 36, wherein the light source, the detector and the computer unit are integrated into an implant together with an energy store for providing voltage.

41. (New) Apparatus according to claim 40, wherein a telemetry unit is integrated into the implant with which it is possible to transmit data and/or energy between the computer unit and a control unit located extracorporeally, wherein for that purpose a probe is connected to the control unit.

42. (New) Apparatus according to claim 41, wherein the telemetry unit and the probe have an oscillatory circuit each with an inductor, wherein the oscillatory circuit on the side of the telemetry unit and the oscillatory circuit on the side of the probe can be tuned for the transmission of data and wherein the data are transmitted without direct contact by coupling the inductors inductively.

43. (New) Apparatus according to claim 41, wherein the energy content of the frequency transmitted by the control unit to the telemetry unit charges an accumulator or a capacitor for the purpose of providing energy to the implant.

44. (New) Apparatus for measuring human blood sugar levels, comprising:

a catheter, the free end of which is to be positioned in a blood vessel, wherein the catheter comprises at least one optical waveguide,

a light source for coupling light into the at least one optical waveguide,

a point of measurement at the free end of the catheter at which point the light is emitted from the at least one optical waveguide, wherein the light is dispersed by the blood and/or transmitted through the blood and wherein the dispersed and/or transmitted light is coupled again into the at least one optical waveguide,

a detector to receive the light which is returned,

a computer unit for analysing the light received by the detector,

a cleansing device located at the point of measurement for removing the tissue particles deposited from the blood, wherein the cleansing device comprises a controllable actuator which frees or wipes clean a light emission orifice of the at least one optical waveguide when activated,

the detector and the computer unit are integrated into an implant together with an energy store for providing voltage,

a control unit located extracorporeally for regulating human blood sugar levels, wherein measured values are transmitted by a telemetry unit to said control unit,

an extracorporeal insulin pump for injecting insulin through the peritoneum, and

a regulator integrated into the control unit which controls the insulin pump subject to the measured values in such a way that the desired blood sugar level is attained.

45. (New) Apparatus according to claim 44, wherein a movement of the actuator is generated by a shape memory alloy, a thermopneumatic drive, an electrostatic drive (piezoelement) or a rotor.

46. (New) Apparatus according to claim 44, wherein the energy required for control purposes is supplied to the point of measurement in electrical, thermal, optical, mechanical, hydraulic or pneumatic form.

47. (New) Apparatus according to claim 44 wherein the measurement at the point of measurement is undertaken by means of transmission (irradiation over a specified sampling length) or by means of diffuse reflection from the surface of the catheter.

48. (New) Apparatus according to claim 44 wherein the catheter is clad with a biocompatible material.

49. (New) Apparatus according to claim 48, wherein the catheter and the optical waveguide are designed as a single piece of solid material.

50. (New) Apparatus according to claim 44, wherein the light source is integrated into the implant.

51. (New) Apparatus according to claim 50, wherein a telemetry unit is integrated into the implant with which it is possible to transmit data and/or energy between the computer unit and a control unit located extracorporeally, wherein for that purpose a probe is connected to the control unit.

52. (New) Apparatus according to claim 51, wherein the telemetry unit and the probe have an oscillatory circuit each with an inductor, wherein the oscillatory circuit on the side of the telemetry unit and the oscillatory circuit on the side of the probe can be tuned for the transmission of data and wherein the data are transmitted without direct contact by coupling the inductors inductively.

53. (New) Apparatus according to claim 51, wherein the energy content of the frequency transmitted by the control unit to the

telemetry unit charges an accumulator or a capacitor for the purpose of providing energy to the implant.